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MAMMALS OF TRES MARIAS ISLANDS, OFF WESTERN MEXICO.

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Mr. E. W. Nelson spent the month of May, 1897, on the Tres Marias Islands in the interest of the Biological Survey of the U. S. Department of Agriculture. This visit has resulted in a large increase in knowledge of the fauna and flora of the islands. The new birds are described by Mr. Nelson in a preceding brochure of the present volume; the new mammals are named in the present paper.

In the Mammal volume of the 'Biologia Centrali-Americana' it is stated that according to Mr. Forrer, a collector who visited the islands in 1881, only three indigenous land mammals, besides bats, occur there. These are a rabbit, a raccoon, and a pigmy opossum. Mr. Nelson obtained all of these and two additional genera, a rat (*Oryzomys*) and a white-footed mouse (*Peromyscus*), and these in spite of Mr. Forrer's statement that "the inhabitants know of no rats or mice whatever in the islands, except, of course, the cosmopolitan *Mus decumanus*" (p. 212). The introduced rat brought back by Mr. Nelson is not the common or Norway rat (*Mus decumanus*), but the Roof rat or gray phase of the Black rat (*Mus rattus*).

Mr. Nelson and his assistant, Mr. E. A. Goldman, collected 146 specimens of mammals, representing nine species, of which the introduced rat is one, three are bats, and five are indigenous terrestrial land mammals. Of the latter, the rabbit is peculiar to the islands, and was described by Allen in 1877; the remaining four I have compared critically with the most closely related

species from the mainland, and find that they differ in such pronounced characters that I am forced to describe them as distinct. One of the bats also is here described as new.

The raccoon was recorded in 'Biologia' as the South American *Procyon cancrivorus*, but with a series of eight specimens before me I am unable to detect any characters by which it can be referred to that species. Its affinities, on the other hand, are distinctly with *P. lotor* and *P. lotor hernandezi*, of which it appears to be merely a pale form, possessing slight though constant cranial differences. In view of these facts, I have described it as a new subspecies of *lotor*. Those who insist on intergradation as the touchstone of subspecies will have to set it up as a full species.

The alleged occurrence of *P. cancrivorus* on the Tres Marias is cited in 'Biologia' "as furnishing another instance of the peculiar affinity of their fauna to that of Southern Central America" (p. 209). Mr. Nelson's collections, however, show that not only the raccoon and all the other mammals, but also the birds, reptiles, and plants, are closely related to species now living on the adjacent mainland of Mexico.

One of the bats obtained by Mr. Forrer is recorded by Mr. Thomas as a young specimen of *Chœronycteris mexicanus*. Inasmuch as this species was not obtained by Mr. Nelson, whereas the commonest bat of the island, a *Glossophaga*, was not recorded from Forrer's collection, and since the two genera are closely related, is it not possible that a reëxamination of the Forrer specimen will show it to be a *Glossophaga* instead of a *Chœronycteris?* Assuming this to be the case, 10 indigenous land mammals are known from the islands. Of these, five, or exactly half, are bats; of the others, one is a Marsupial; one a Carnivore, and three are Rodents.

Of marine mammals three are recorded, a seal and two porpoises, but since only one of these was obtained, the identification of the other two is uncertain.

Marmosa insularis sp. nov. Tres Marias Pigmy Opossum.

Type from Maria Madre Island Mexico. No. 89215 ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 16, 1897, by E. W. Nelson and E. A. Goldman. Original No. 11028.

Characters.—Size and general appearance as in *M. canescens*, but ears larger, tail longer, fore feet smaller, color more fulvous, skull longer and more slender.

Color.—Upper parts drab brown suffused with pale dull fulvous, purest and strongest on sides of neck; black rings around eyes broader, and reaching farther forward on sides of nose, than in *M. canescens;* median facial stripe buffy fulvous, narrower and more sharply defined than in *canescens;* under parts buffy yellow, deepest on throat and breast. In the 4 specimens examined there is no white on the tail; *canescens* commonly has the terminal part white.

Cranial characters.—Skull similar to that of *canescens* but longer, decidedly narrower and more slender; brain case more rounded; rostrum, palate, and base of skull between audital bullæ conspicuously narrower.

Measurements.—Type specimen: Total length 270; tail vertebræ 167; hind foot 19.5. Average of 3 males from type locality: Total length 285; tail vertebræ 170; hind foot 20.

Remarks.—Five specimens of this pretty little opossum were obtained on Maria Madre Island and present practically no individual variation. Mr. Nelson states that the species was common in the forest on top of the ridge which extends along the middle of Maria Madre Island.

Oryzomys nelsoni sp. nov. Nelson's Rice Rat.

Type from Maria Madre Island, Tres Marias Islands, Mexico. No. 89200 ♂ ad., U. S. Nat. Mus., Biological Survey Collection. Collected May 13, 1897, by E. W. Nelson and E. A. Goldman. Original No. 11022.

Characters.—Size large (decidedly larger than *O. mexicanus*); tail exceedingly long and nearly naked; ears medium, scant haired and rather pale; color yellowish fulvous; skull large and massive.

Color.—Upper parts dull yellowish fulvous, slightly darkened on head and back by blackish hairs, becoming pale buffy ochraceous on flanks and thighs; underparts white, the plumbeous underfur showing through in places; tail dark except on proximal ⅓ or ½ of under side which is pale yellowish; hind feet scantily haired with whitish hairs.

Cranial and dental characters.—Skull very large and massive, increasing in length (but not in breadth) with age; interparietal very broad anteroposteriorly. Contrasted with *O. mexicanus* Allen, the skull is very much larger and heavier (even the ♀ being much larger than the ♂ of *mexicanus*); the rostrum decidedly larger; the interparietal broader anteroposteriorly, and the molar teeth relatively as well as actually much broader.

Measurements.—Type specimen, ♂ ad.: Total length 342; tail vertebræ 190; hind foot 38. An adult ♀: Total length 320; tail vertebræ 185; hind foot 37. Average of 2 adult males from type locality: Total length 343; tail vertebræ 190.5; hind foot 38.5.

Remarks.—Mr. Nelson found this new species living in damp thickets and about springs near the summit of Maria Madre Island, where four specimens were obtained.

Peromyscus madrensis sp. nov. Tres Marias Mouse.

Type from Maria Madre Id., Tres Marias Islands, Mexico. No. 89223 ♂ ad. U. S. Nat. Mus., Biological Survey Coll. Collected May 18, 1897, by E. W. Nelson and E. A. Goldman. Orig. No. 11040.

Characters.—Size rather large; tail long and scant haired; ears medium; color dull pale fulvous; skull without superciliary ridges. In general, similar to *P. spicilegus* Allen, but much larger, with longer tail and shorter ears.

Color.—Upper parts pale dull fulvous (almost ochraceous buff) with an indistinct darker dorsal band on posterior half of back; under parts, lips and feet white; a salmon or fulvous pectoral spot or streak usually present; a dark spot on upper side of ankle; eyelids dark; ears essentially same color as body; tail dark above and at tip all round; whitish below.

Cranial characters.—Skull rather flat and smoothly rounded; rostrum elongate; no supraorbital ridges. Compared with *P. spicilegus*, its nearest known ally from the mainland of Mexico, the skull of *P. madrensis* is larger, the brain case decidedly broader and flatter; the molar series of teeth actually of the same length (relatively shorter) and somewhat broader.

Measurements.—Type specimen: Total length 222; tail vertebræ 119; hind foot 26. Average of 12 specimens from type locality: Total length 224; tail vertebræ 120; hind foot 26.

Remarks—This mouse, according to Mr. Nelson's notes, is the most common rodent on the islands. He says: "Specimens were taken on all three islands. They were generally distributed in the forest above the shore belt which is infested by land crabs, and were found more commonly about the fig trees on the high interior ridge of Maria Madre than elsewhere." Specimens from Cleofa Id. are larger than those from Maria Madre Id. (average of 3: total length 229.5; tail vertebræ 120; hind foot 27.8) and have larger and heavier skulls. Two specimens from Magdalena Id. have a pale saffron-yellow wash on the belly, probably due to staining.

Mus rattus Linn. Introduced Rat.

Mr. Nelson states that this introduced rat, of which he brought back two specimens, was found in small numbers over most parts of Maria Madre Id., where it lives in the forest like the native mice.

Lepus graysoni Allen. Tres Marias Cottontail.

Lepus graysoni Allen, Monog. N. Am. Rodentia, 347–348, 1877. Type from Tres Marias Ids., Mexico.

Mr. Nelson obtained 16 specimens of this very desirable rabbit. He states that the species occurs abundantly on the two larger islands, Maria Madre and Magdalena, and the small San Juanito, and is reported to occur on Maria Cleofa Island also.

Procyon lotor insularis subsp. nov. Tres Marias Raccoon.

Type from Maria Madre Island, Tres Marias Ids., Mexico. No. 88978 ♂ old, U. S. Nat. Mus., Biological Survey Coll. Collected May 10, 1897, by E. W. Nelson and E. A. Goldman. Orig. No. 10985.

Characters.—Similar to *P. lotor* and *hernandezi* but smaller and paler; ears smaller and only slightly marked at base; top of head grayer.

Cranial characters.—Skull in general similar to those of *P. lotor* and *hernandezi* but relatively shorter; frontals at and behind plane of postorbital processes broader; squamosal arm of zygomatic arch more expanded vertically; mastoid processes decidedly shorter and thicker; pterygoids squarely truncate anteriorly and of even breadth throughout (as seen from below), instead of tapering anteriorly to a thin point or scale as in both *lotor* and *hernandezi;* audital bullæ slightly smaller than in *hernandezi*, decidedly smaller and less inflated than in *lotor*.

Dental characters.—Premolars somewhat larger and more crowded than in *lotor;* upper carnassial as in *lotor*—smaller than in *hernandezi;* first upper molar about the same size as in *lotor* and similar in form, smaller than in *hernandezi* and much less quadrate.

Measurements.—Type specimen ♂ ad.: Total length 854; tail vertebræ 286; hind foot 132. An adult ♀: Total length 735; tail vertebræ 232; hind foot 126. Average of 5 adult males from type locality: Total length 841; tail vertebræ 287; hind foot 131.

Remarks.—Mr. Nelson found the Raccoon common on the two larger islands, Maria Madre and Maria Magdalena, but saw no signs of them on Maria Cleofa although told that they occur there sparingly.

? **Zalophus californianus** (Lesson). Sea-Lion.

In the absence of positive knowledge as to the identity of the Tres Marias seal, it is referred provisionally to the above species. It is of course possible that the Guadalupe fur-seal (*Arctocephalus townsendi*) may occur here also.

Mr. Nelson's notes contain the following: "A large seal or sea-lion, called *lobo marino* or sea wolf by the Mexicans, was reported to occur at several places on the rocky shores of Maria Magdalena and Maria Cleofa Islands. We heard of them first before leaving San Blas and again when we reached the islands. From the accounts received it was evident that they had been hunted for sport by various visitors until they had become comparatively scarce. We made careful inquiries, and, after learning of the location of the places most frequented by them on both islands, visited these places under the guidance of a tortoise-shell hunter who was very familiar with the shore. Only a single seal was seen; it was on a rocky islet off the shore of Maria Cleofa, and took to the water and disappeared before we could get a shot. Our guide informed me that at times the seals disappear from the islands for a few days, and this may account for our failure to find them in their usual haunts. The consensus of opinion among the residents of Maria Madre Island was that these animals are now very scarce. Formerly they were found at many places,

but at present a rocky point on the northwest side, and a jutting reef on the south side of Maria Magdalena Island, and some islets off the west shore of Maria Cleofa, are the landing places used by the remnants of the considerable number that once lived here. They are doubtless doomed to speedy extinction."

Rhogeëssa parvula H. Allen. Tres Marias Rhogeëssa.

Rhogeëssa parvula H. Allen, Proc. Acad. Nat. Sci. Phila., 285, 1866. Type from Tres Marias Ids., Mexico.

A single badly mutilated specimen of this little known bat was shot on Maria Madre Id., where, according to Mr. Nelson's notes, it is "not uncommon in the forest."

Myotis nigricans (Maximilian). Maximilian's Black Bat.

Mr. Thomas states that "a specimen of this species was obtained by Mr. Forrer in the Tres Marias Islands." (Biologia Centrali-Americana, Mammalia, 206, 1881.)

Otopterus mexicanus (Saussure). Big-eared Bat.

Macrotus mexicanus Saussure, Rev. et Mag. de Zool., 2e sér. XII, 486–487, 1860. Type from Yautepec, Morelos, Mexico.

This large long-eared bat is very common on Maria Madre Id., where Mr. Nelson collected 52 specimens. He found it in the daytime in two or three caves, and also in an old unused warehouse. The females were heavy with young at the time of his visit (May, 1897). I have compared Mr. Nelson's Tres Marias specimens with specimens collected by him near the type locality of Saussure's '*Macrotus mexicanus*' in the State of Morelos, Mexico, and find no tangible differences except that the ears of the island specimens are slightly the larger. I have also compared both series with a fine series of topotypes of *Otopterus bulleri* (H. Allen) from Bolaños, Jalisco, and am unable to find any characters on which the latter form can stand.

Glossophaga mutica sp. nov. Tres Marias Glossophaga.

Type from Maria Madre Id., Tres Marias Ids., Mexico. No. 89271 ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 8, 1897, by E. W. Nelson and E. A. Goldman. Orig. No. 10976.

Characters.—Similar to *G. soricina* (Pallas) and *G. truei* H. Allen, but differing in proportions and color—reddish brown instead of gray or sooty.

Color.—Fur of upper parts with basal ¾ dull white; apical ¼ dull cinnamon brown; underparts similar but much paler.

Cranial and dental characters.—In the absence of authentic skulls of *G. soricina* and *truei* for comparison it is impossible to differentiate the cranial characters of *G. mutica*. The rostrum is rather broad, flat, and swollen; a rounded protuberance over each orbit marks the junction of the rostrum with the braincase; the braincase is abruptly elevated and

strongly inflated and arched; the basisphenoid is strongly keeled along the median line and its posterior fourth is abruptly elevated and has a pocket or fossa on each side between the audital bullæ, and on the same plane with the basioccipital; the zygomatic arches are slender, nearly parallel, rods; the upper canines divaricate so strongly that they are conspicuous when the skull is viewed from above; the premolars are narrow and well spaced; the molars are small and weak.

Measurements of type specimen, ♂ ad.: Total length (in flesh) 65 mm.; tail vertebræ (in flesh) 8; [following measurements from dry skin] forearm 35.5; metacarpal of 3d (longest) digit 35.5; tibia 14; ear from anterior basal angle 9; tragus from outer base 4.5.

Remarks.—Mr. Nelson obtained 37 specimens of this new *Glossophaga* on Maria Madre Id., where he found it inhabiting caves. Many of the females contained partly developed embryos.

Chœronycteris mexicana Tschudi. Tschudi's Bat.

Chœronycteris mexicana Tschudi, Fauna Peruana, I, 72–73, 1844. Type from Mexico.

"An immature specimen of this somewhat rare species is contained in Mr. Forrer's Tres Marias collection."—(Mr. Thomas in Biologia Centrali-Americana, 207, 1881). As already suggested, it would be worth while to reëxamine this specimen with reference to the possibility of its being *Glossophaga mutica.*

Lasiurus borealis mexicana (Sauss.). Mexican Red Bat.

Atalapha mexicana Saussure, Rev. et Mag. de Zool., 2e sér. XIII, 91, March, 1861. Type from Mexico.

This species was not obtained by Mr. Nelson, but is recorded by Thomas (under the old name *Atalapha frantzii*) as collected by Forrer on the Tres Marias. (Biologia, Mammalia, 205, 1881.)

? Phocæna communis Lesson. Common Porpoise.

Mr. Nelson states that "a porpoise, supposed to be this species, was common around the shores of the Tres Marias Islands, and also in bays and at the mouths of streams or lagoons along the coast of the mainland. They were always seen in the belt of shallow discolored water within a short distance of shore. As soon as the blue water was reached, with a depth of over 40 fathoms, the other species, *Prodelphinus longirostris*, was encountered. The present species was seen in schools of from ten to thirty or forty individuals swimming in loose order. At Maria Madre they came into the bay and close along shore early in the morning."

Prodelphinus longirostris (Gray). Long-nosed Porpoise.

Mr. Goldman shot a porpoise 12 to 15 miles off the islands, which Mr. F. W. True has kindly identified as *Prodelphinus longirostris* (Gray). Mr. Nelson states that there were probably 200 in the school from which this specimen was secured, and that a number of such schools were seen between San Blas and the islands.